

AIR BOTTLE CARRIER

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates to a carrier for air bottles, and in particular to a
5 collapsible air bottle carrier.

While the invention was specifically created for use with air bottles of the type used by firemen, it will be appreciated that the carrier can be used for other air bottles, e.g. scuba diver air tanks.

DISCUSSION OF THE PRIOR ART

10 It is common practice to carry air bottles loose on fire trucks and other vehicles. The bottles are stored in any available location on a vehicle, and are placed loose on the ground at the site of the fire. After the tanks have been used, they are again placed on the ground and often become mixed with fresh air bottles. Thus, a need exists for a carrier for air bottles which can be used on fire trucks and
15 other vehicles. By storing and transporting only filled bottles in the carrier, the chances of mixing used with fresh bottles are substantially reduced.

GENERAL DESCRIPTION OF THE INVENTION

The object of the present invention is to meet the above defined need by providing a relatively simple air bottle carrier, which is collapsible for compact
20 storage when not in use.

Accordingly, the invention relates to an air bottle carrier comprising a rectangular bottom frame; support bars in said bottom frame; pockets in top edges of said support bars for receiving hemispherical bottom ends of air bottles; a rectangular top frame for resting on said bottom frame in a collapsed condition of the

carrier; crossbars in said top frame defining sleeves for supporting sides of air bottles; hinges interconnecting the corners of the bottom frame to the corners of the top frame; and stops for limiting movement of the hinges when the carrier is an erect, use condition.

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BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described below in greater detail with reference to the accompanying drawings, which illustrate a preferred embodiment of the invention, and wherein:

10 Figure 1 is an isometric view of the bottle carrier in accordance with the present invention in a collapsed condition;

Figure 2 is an isometric view of the carrier of Fig. 1 in a partially erect condition;

Figure 3 is an isometric view of the carrier of Figs. 1 and 2 in the fully erect condition;

15 Figure 4 is a top view of a bottom frame used in the carrier of Figs. 1 to 3;

Figure 5 is an exploded isometric view of a hinge used in the carrier of Figs. 1 to 3 in the erect condition;

Figure 6 is an isometric view of a second embodiment of the bottle carrier of the present invention in a partially erect condition;

20 Figure 7 is an exploded isometric view of one corner of a bottom frame of the carrier of Fig. 6 as seen from below; and

Figure 8 is an isometric view of the carrier of Fig. 6 in the fully erect condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the following description of two embodiments of the invention, wherever possible the same reference numerals have been used to identify the same or similar elements.

5 The principal elements of the air bottle carrier shown in Figs. 1 to 4 of the drawings include a square bottom frame 1, a square top frame 2 and four corner hinges 3.

The bottom frame 1 is rectangular with a pair of parallel sides 4 and ends 5. The sides 4 extend beyond the ends 5, the outer free ends of the sides defining
10 stops 6 at the corners of the frame 1 for limiting movement of the hinges 3 as described below in greater detail. Other hinge stops in the form of pins 7 extend outwardly from the ends 5 of the frame 1. A flat, horizontal, reinforcing ledge 8 (Figs. 3 and 4) extends inwardly from the lower ends of the sides 4 and the ends 5 of the bottom frame 1. Parallel, bottle supporting strips or bars 9 extend diagonally between opposite interior corners, and between the sides 4 and the ends 5 of the frame 1. The strips 9 intersect each other at right angles, and include concave grooves 10 in their top edges defining nine pockets for supporting the hemispherical bottom ends of cylindrical air bottles (not shown).

The square top frame 2 has the same dimensions as the bottom frame 1, so
20 that the top frame 2 rests on the upper end of the bottom frame when the carrier is in the collapsed condition (Fig. 1). Like the bottom frame 1, the top frame 1 includes a pair of parallel sides 12 interconnected by parallel ends 13. Crossbars 14 extend between the sides 12 and ends 13, defining square sleeves slidably receiving air

bottles (not shown) and for supporting the upper ends of the bottles. The crossbars 14 are parallel to each other and to the sides 12 and ends 13 of the top frame 2.

As best shown in Fig. 5, each hinge 3 is defined by upper and lower arms 15 and 16, respectively. The top end of each upper arm 15 is pivotally connected to an 5 end wall 5 near a corner of the frame 2 by a bolt 18 and a nut 19. A Teflon (trademark) washer 20 (Figs. 2, 3 and 5) spaces the arm 15 from the top frame 2. The bottom end of the upper arm 15 is pivotally connected to the top end of the lower arm 16 by a bolt 22 and an internally threaded knob 23. The bottom end of the lower arm 16 is pivotally connected to an end 5 of the bottom frame 1 near a 10 corner thereof by a bolt 24 and a nut 25. An elongated flange 26 extends outwardly and upwardly from the inner edge of the top end of the lower arm 16 (in the erect position). The flange 26 defines a third stop for limiting rotation of the arms 15 and 16. When the carrier is in the collapsed or storage position (Fig. 1), the bottom arm 16 of the hinge abuts the pin 7, limiting downward rotation of the hinge. When the 15 carrier is in the erect condition, the flange 26 abuts the inner bottom end of the upper arm 15 and the stop 6 abuts the outer bottom end of the arm 16 to maintain the arms 15 and 16 vertically aligned.

A generally C-shaped handle 28 is provided on the center of each end 13 of the top frame 2. The handles 28 are slidably mounted in lugs 29 extending 20 outwardly from the ends 13 for spacing the handles from the frame 2 facilitating manual access to the handles. Pins 30 extend diametrically through the bottom ends of the vertical sides of each handle for limiting upward movement of the handle in the lugs 29.

In the collapsed condition, with the top frame 2 abutting the bottom frame 1 and the handles 28 in the lower position (Fig. 1), the carrier is compact for storage. By tightening the knobs 23 on the bolts 22, rotation of the arms 15 and 26 of the hinges 3 relative to each other is prevented, i.e. the carrier is locked in the collapsed 5 position for storage or transport. The carrier is easily erected by loosening the knobs 23 and lifting up on the handles 28 to pull the top frame 2 upwardly (Fig. 2). The erect carrier is locked in the erect condition by rotation of the knobs 23. The square openings in the top frame 2 slidably receive air bottles. The hemispherical bottom ends of the bottles rest in the concave grooves 10 in the strips 9 to stabilize 10 the bottles during transport.

Referring to Figs. 6 to 8, a second embodiment of the invention includes the same basic elements as the carrier of Figs. 1 to 5. Accordingly only the modifications to the first embodiment of the carrier are described below.

In the second version of the carrier, the stops 6 are replaced by pins 32 15 extending outwardly from the corners of the carrier for limiting movement of the lower arms 16 of the hinges 3. The nuts 19 are omitted and the spacers 20 are replaced by projections or bosses 31 on the ends of the top frame 1 with threaded holes (not shown) for receiving bolts 18. The bottom ends of the lower arms 16 of the hinges 3 are connected to the ends 5 of the bottom frame 1 by bolts 24 only. 20 The reinforcing ledge 8 is replaced with triangular gussets 33 (Fig. 7) at each corner of the bottom frame 1. Small feet-defining posts 34 are provided on the bottom of the gussets 33. The posts 34 may include holes 36 (shown in phantom) for receiving the shafts 37 of casters 38 so that the carrier can be rolled along a floor or the ground. The bottle supporting bars 9 include concave depressions 40 defining

bottle receiving grooves, and cruciform rubber covers 41 are mounted on the intersecting bars 9 to cover the grooves for cushioning the bottom ends of metal air bottles (not shown) when they are deposited in carrier.

As best shown in Fig. 6, the hinges 3 of the second embodiment of the carrier differ from the hinges shown in Figs. 1 to 3. Specifically, the upper arm 15 of each hinge 3 overlaps the lower arm 16, and is connected to the lower arm 16 by a bolt 43 and a nut 44 (Fig. 8). A second bolt 45 extends through the top end of the lower arm 16 and the upper arm 15 into a knob 23 above the bolt 43 in the erect position of the carrier (Fig. 8). When the knob 23 is loosened and the upper frame 2 is moved to the erect position, the bolt 45 enters an arcuate slot 49 (Figs. 6 and 8) in the upper arm 15. The knob 23 can then be tightened against the bottom end of the upper arm 15 to lock the carrier in the erect position. Alternatively, a threaded hole (not shown) can be provided in the top end of the arm 16 above the bolt 43, and the bolt 45 and the knob 23 can be replaced by a knob 23 having a bolt on the inner end thereof.

Referring to Fig. 8, when the carrier includes casters 38, a handle 50 is provided for pulling the carrier. The handle 50 is defined by an elongated rod with a generally C-shaped hook 52 at the bottom end thereof for rotating an opening in a triangular lug 53 extending outwardly from the center of at least one and preferably both ends 5 of the bottom frame 1. A generally C-shaped loop 54 is provided in the handle 50 above and opening in the opposite direction to the hook 52. The spacing between the hook 52 and the loop 54 is such that the loop 54 can be placed on a handle 56 on the center of an end 13 of the top frame 2. The dimensions of the loop 54 and the handle 56 are such that there is a friction fit between the two, so that the

handle 50 does not flop around when not in use. The top end 57 of the handle 50 has an inverted L-shape to facilitate gripping of the handle.

The final important difference between the second and first embodiments of the carrier is the handles 56 of the second embodiment. The handles 56 are generally C-shaped and extend horizontally outwardly from the top frame 2.

Because, firefighters usually wear heavy gloves, it is important that the handles 56 have a large opening, and the large, C-shaped handles 56 meet this need.

Thus, there has been described a structurally simple, collapsible air bottle carrier, which is easy to erect and collapse, and which provides excellent support for air bottles during transport. The use of the carrier facilitates the separation of full from empty or partially empty bottles. During the confusion at the site of a fire, it should not be necessary for a fireman to rummage through air bottles to find a full bottle. Of course, the carrier can also be used to carry air bottles used by scuba divers and others.